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# PROMOTION NEEDS FOR TIMBER CONSTRUCTION *

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## A B S T R A C T

In most forest-rich developing countries wood is not widely used in construction. Lack of tradition and inadequate technical knowledge on how to properly use wood as a building material have generated prejudice against timber construction. In order to reverse this situation it is necessary that promotional activities be undertaken in these countries.

For short term results promotion shoud be directed towards policy makers, aiming at the implementation of complete package projects. For medium and long term results, promotional activities should be geared towards educating engineers, architects, and the general public on the proper utilization of wood as a building material. To reach this goal, wood technology laboratories of developing countries, given adequate support, could function as irradiating centers for disseminating modern timber construction techniques.


Key words: timber construction, wooden houses, promotion needs, developing countries.

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## 1. INTRODUCTION

The fact that in most developing countries wood has not been used in construction to a degree commensurate with their usually abundant forest resources has been widely recognized.

One of the recommendations of a 1967 UNIDO symposium on industrial development ( 8) referred to the organization of an expert group to study the utilization of wood-based products as building materials in developing countries. This study group met in Vienna in November 1969 and focused attention primarily on the production techniques for the use of wood in housing, under conditions prevailing in developing countries ( 9 ).

The utilization of wood for house construction, with emphasis on the needs of developing countries, was the object of the "World Consultation on the Use of Wood in Housing", held in Vancouver, CAnada, in July 1971, under the joint sponsorship of UNIDO, FAO, and UNCHBP (13).

More recently during the "First consultation on the wood and wood products industry", organized by UNIDO and FAO in Helsinki, in September 1983, this issue was discussed at length (12). One of the recommendations approved by this consultation was for UNIDO to promote education and training in the use of wood for construction in developing countries.

Some 11 million hectares of tropical forests are cleared every year to provide agricultural land in developing countries (14), but very little of this resource is used to ameliorate the acute

housing shortage of these nations, or for other useful purposes such as providing utility buildings, bridges, etc.

The reasons for this unfortunate situation have been discussed by many experts. In his background paper for The Helsinki consultation, Tejada ( 5 ) states that prejudice against wooden houses, due to lack of tradition and appropriate technical information, is the most important factor restricting its use in developing countries.

The objective of this paper is to analyze some of the factors inhibiting timber construction in developing countries and to discuss actions to overcome them.

## 2. DEFINITION OF AUDIENCES / TARGETS

In most developing countries, as a result of the present stage of development of their wood industry, a piece of lumber cannot be considered an industrial product manufactured to meet specific size and quality requirements.

The lumber industry of these countries is usually made up of a large number of small sawmills with little access to modern technology. These units are dedicated to the processing of raw material, while it lasts, available from neighboring native forests. More often than not, the sawmilling operation is set up to help finance the costs of developing new farming areas and only processes a small number of high-value species that compensate transportation costs to the consuming centers.

This situation, in contrast to that usually found in developed countries, is not conducive to a widespread utilization of wood

in applications that require high volumes of an industrial-quality product. As a result, in many cases wood has been displaced by other types of material that present uniform quality, and that are available in large quantities at reasonable prices. In many countries, the present trend is for wood to be used in situations where it is available at little or no cost, such as shacks built with scrap pieces, or where price is not a limiting factor, such as custom-built luxury homes (6).

(a) Short term targets

In order to be effective on a short term basis, any promotional activity has to be directed towards those people or institutions that control or have influence over projects that may utilize significant volumes of wood.

Since lack of tradition and lack of technical information constitute the main barriers against wood construction in developing countries, each project, in order to assure full success, should be dealt with as a complete package. This package should consider technical and legal, as well as social and financial factors.

Technical factors are those related to the conditions of raw material supply, industry infrastructure, design considerations, manufacture of components, resistance against fire and biodeteriorations, erection techniques, maintenance requirements, etc. Legal factors are those related to building code regulations and municipal postures. Social factors refer mainly to consequences brought about by timber construction to people's lives and their reactions, not only with regard to habit and tradition, but also with regard to job opportunities.

In the case of housing, due to the scarcity of capital to pay for land infrastructure and for the construction costs, the usual case is that government funding agencies are more and more responsible for the financing of housing projects, thus controlling all decisions about what and how to build. These agencies would be the main audience for promotional activities that could bring immediate results.

The recently published UNIDO "Manual for Popular Wooden House Construction" (11) has its origin in a package-type project (3) developed to fulfill the housing needs of low-income groups of Manaus, Brazil, as requested by S.H.A.M. (Housing Society of Amazon State), a local agent for the National Housing Bank, BNH.

The conception of the S.H.A.M. wooden house project started with a survey about the habits of the local people with regard to use and occupation of the spaces in the House, architectural solutions, traditional building techniques, and availability of materials (4).

A prototype was built first on IPT campus, in São Paulo, and its performance fully evaluated with respect to structural behavior, fire resistance, thermal insulation, rain water penetration, electrical installations, and durability against biodeterioration. The results of this evaluation were incorporated in the final design that was used in the construction of 40 homes.

A similar example presently being implemented is a housing project supported by the township of Campos do Jordão, a mountain resort about 100 miles north of São Paulo, Brazil, which intends to use wood obtained from local slash pine (P.Elliottii) plantations (2).

The methodology followed in this case was the same as that used in the S.H.A.M. project. After a preliminary survey of the local physical and social conditions, a prototype was built at IPT and fully evaluated and the revised project is now being utilized for the construction of 133 houses. Due to the relatively cold climate of the region and in order to maintain the local tradition of wood stoves, which are used for cooking and heating, the kitchen and bathroom areas are built in masonry.

The utilization of wood in house construction has received greater emphasis, mainly due to the social problems and to the magnitude of the numbers involved. However, there is also a need to promote timber construction in other areas, such as farm and light industry buildings, schools, bridges, etc. (12). Again, for immediate results, promotion activities are to be focused on those holding decision-making responsibilities.

For example, the wooden bridges project developed by UNIDO (10) may have considerable impact in developing countries if properly disseminated among local officials in charge of municipal roads or among government authorities responsible for large regional development projects.

In the same fashion, modular projects for utility buildings could also be developed and used on a larger scale to meet, for example, the growing demand of developed countries for grain storage space.

In both cases, the project should be envisaged as a full package that, in addition to the enginnering aspects, also takes into account local conditions of materials supply, man power availability, and, most of all, provides adequate financing schemes.

(b) Medium and long term targets

The examples described in the previous paragraphs relate to projects whose concept and implementation were the responsibility of a small group of people, i.e., technical experts and policy makers. However, in order to achieve a broader acceptance of timber construction in developing countries, medium and long term actions are necessary.

In regions that have no tradition in the use of wood for construction purposes, these actions should aim at convincing people that wood is an adequate construction material; such an educational effort could last for one or more generations.

In developed countries, the promotion of timber construction is carried out mainly by organizations supported by industry and that work in close connection with government research institutes. As explained earlier in this paper, with a few exceptions, most developing countries do not have such organizations because they dont have a strong wood industry sector. Untill the wood industry in these countries reachs maturity, promotion of timber construction has to be effected by other mechanisms.

## 3. CENTERS FOR TIMBER CONSTRUCTION TECHNOLOGY

Although developing countries do not use, by and large, wood in construction to any appreciable degree, many of them can count with one or more wood technology laboratories or centers that represent the reservoir of local expertise on the subject.

In the absence of industry and trade organizations, these centers could function as the focal point for the promotion of

of timber construction. They could work together with government agencies, universities, professional associations, vocational schools, etc., to generate favorable conditions for the proper use and acceptance of wood as a construction material.

Wood is a facinating subject and a number os professionals, mostly engineers and architects, are known to have fallen in love with it. These professionals are the natural promoters of wood and efforts should be made in order to tap their energy and creative abilities for the maximum benefit towards the development of timber constructions. A good example of such action was the establishment, in the city of Rio de Janeiro, in 1983, of the "Center for Development of Wood Applications" - DAM, under the leadership of Mr. José Zanine Caldas.

With help from international organizations and from their local governments, these timber construction centers could carry out a number of activities such as:

a) maintain a data base on relevant properties of local species in order to give advice on their utilization;

b) collect and make available to interested professionals up-to-date information on timber design procedures, till a national code becomes available;

c) co-operate with national standard bodies in the development of lumber standards and design codes, leading to a more effective use of wood in structural applications;

d) develop and publish information about construction systems and on appropriate techniques for processing lumber, and for the fabrication of building components;

e) organize seminars and workshops on topics related to timber construction, making special efforts to bring renown specialists from countries that have tradition in wood constructions;

f) assist universities in establishing undergraduate courses dealing with wood technology and the use of wood in construction;

g) assist vocational schools in establishing training courses for carpenters, wood workers, kiln operators, saw doctors, etc.;

h) collect information and maintain a file on timber construction projects, with emphasis in aspects such as cost, durability, structural and fire safety;

i) assist all levels of government in any program that can benefit from the use of wood in construction, like housing, rural development, schools, municipal roads, etc.;

j) assist industry in developing adequate production capacity and in reaching acceptable levels of quality for their products;

k) build demonstration projects showing modern timber construction techniques.

## 4. CONCLUSIONS AND RECOMMENDATIONS

The need for promoting wood construction in developing countries has been recognized for a long time.

In many countries, especially those colonized by mediterranean nations, there is no tradition of wood construction and people

generally do not bellieve that wood is an adequate construction material.

In addition, in most developing countries the wood industry sector is not adequately developed to produce large volumes of uniform quality, moderate cost lumber for construction purposes.

Given the situations described above, the following recommendations are made:

1. in order to bring immediate results, promotional activities should be based on full package projects, that consider all factors involved in timber construction, from material supply and man power availability to social and financial aspects;

2. UNIDO has already published material that supports such projects in the areas of self help construction and municipal bridges. Efforts should now be concentrated on other types of construction such as farm and light industry buildings, grain storage structures, etc.;

3. a wider use of wood in construction similar to that found in developed countries, can only be achieved over a long period of time; it will be necessary to educate people, to generate apropriate lumber standards and design procedures, to develop adequate industrial infrastructure, and to train man power. In order to accomplish all these tasks it is essential that the local wood technology laboratories be strengthened, so that they can serve as irradiating centers for wood construction technology in their respective countries.

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